



BREATHING

Opportunities to improve the quality of asthma care in Saskatchewan

There are opportunities to improve the management of asthma in Saskatchewan.

In 2003-04, 18 per cent of people with asthma in our study population had poor control of their condition and used medications for symptom relief (short-acting beta2-agonists) too frequently. Improved management would mean better quality of life.

Hospitalizations due to asthma can be reduced with better drug management.

Our study shows a rate of 11 hospitalizations per 1,000 people with asthma, with a two-fold variation between highest (19/1,000) and lowest (8/1,000) rates in the province. Canadian statistics show that Saskatchewan's asthma hospitalization rates are one third above the national average and 45 per cent higher than the best province, Ontario.

Medications to prevent asthma symptoms are underused and their use should be increased.

Examples of such drugs are inhaled corticosteroids. Of those patients in poor control, 37 per cent were not dispensed any inhaled corticosteroids, and 40 per cent received potentially inadequate doses.

Use of wet nebulized asthma drugs can be significantly reduced.

There were 1,249 people dispensed wet nebulized asthma medication, when more effective and cheaper dry-powdered forms of the same medications are available.

Regular use of spirometry—an objective measure for assessing asthma control—should be increased.

Only nine per cent of people with asthma in our study population had a spirometry test in 2003-04.

Why look at the quality of asthma care in Saskatchewan?

Asthma is a common chronic lung condition that can usually be controlled with proper management. Some of the key elements of good management of asthma include having a good understanding of the disease, using

medications for acute symptom relief (short-acting beta2-agonists) only occasionally, relying more heavily on "preventer" medications (such as inhaled corticosteroids) to reduce flare-ups of the condition, avoiding triggers of asthma (such as pets or smoke), and monitoring the condition carefully on an ongoing basis. Poor control leads to increased symptoms, emergency room visits, hospitalizations and, in rare cases, death.

Identifying the gap between actual and optimal asthma care in Saskatchewan is an important first step in identifying opportunities to optimize asthma management and improve quality of life for people living with asthma.

How did we assess quality?

We measured prevalence and looked at nine core quality indicators representing different aspects of asthma care, including hospitalization, drug management, and diagnostic testing (spirometry use). Our indicators are based on 1999 and 2001 Canadian Asthma Consensus Guidelines¹⁷ as well as input from a local panel of experts.

This study used de-identified Saskatchewan Health data on hospitalizations, physician billings, drug claims, and vital statistics.

We examined patterns of care in fiscal year 2003-04 for Saskatchewan residents who had at least some combination of physician visits or hospitalizations for asthma or prescriptions for asthma drugs in the previous year. The case definition is based on the "HEDIS" definition of asthma, validated and used widely in the United States.¹ We excluded those under age six and over age 55, because such patients could be confused with those who have bronchitis or chronic obstructive pulmonary disease. For similar reasons, we excluded anyone noted concurrently to have cystic fibrosis. Registered Indians were excluded because their drug claims were not available in our database.



BREATHING EASIER:

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“After asthma education sessions, our child took much more responsibility for taking his medications correctly”

Study limitations

This study had the following limitations:

- Some patient visits for asthma and spirometry tests may not have been recorded in our physician billing databases (e.g., services provided by nurses or certain non-fee-for-service practices);
- Some asthma drugs dispensed were not captured in our database (e.g., where the individual had drug coverage from a federal program (e.g., veterans, RCMP), received a free sample, or took an Exception Drug Status medication without approval);
- Diagnostic information was not available on drug claims, and we could not be completely certain that a drug typically prescribed for asthma was actually used for this purpose;
- Pharmacy claims do not capture prescriptions written but not dispensed;
- We have no way of knowing if patients took the drugs as prescribed; and,
- Some dimensions of quality (e.g., knowledge of asthma, avoidance of triggers) could not be assessed due to lack of data.

How are we doing in Saskatchewan?

For more detailed information on results, please see the full Research Report (www.hq.sask.ca).

- In 2003-04, there were 24,180 people aged 6 to 55 with asthma, of whom 49 per cent were female. The overall prevalence of asthma in this age group was four per cent. The mean and median ages were 27 and 25 years, respectively.
- Saskatchewan's hospitalization rate for asthma was 11 per 1,000 people with asthma. There was a two-fold difference between highest and lowest rates across the province.
- In 2003-04, 18 per cent of persons (4,267) with asthma in our study population had poor control of their condition. Such patients were either using high amounts of short-acting beta2-agonists (SABAs), had a hospitalization for asthma, or died from asthma.
- Among persons with poor asthma control, 37 per cent were not dispensed any preventer medication, 37 per cent were not dispensed any inhaled corticosteroids (ICS), and 40 per cent received a low and potentially inadequate dose of ICS.
- Persons with poor asthma control and already taking high doses of inhaled corticosteroids could potentially benefit from an additional preventer medication. However, only 42 per cent of such patients received these drugs.
- There were 1,249 persons with asthma dispensed wet nebulized asthma drugs despite the fact that more effective and cheaper dry-powdered forms of the same medications are available. The youngest age group (6-9 years) had the highest wet nebulized drug use. Rates of use were lowest in Saskatoon and Regina Qu'Appelle Health Regions.
- Only nine per cent of asthma patients had a spirometry test done in 2003-04.
- Saskatoon had the lowest hospitalization rate, and also had lower rates of poor control, lower rates of high SABA use, and higher use of spirometry. Sun Country and Five Hills had the highest hospitalization rates, and also had higher rates of either poor control,

high SABA use, or non-use of inhaled corticosteroids among patients with poor control.

- For drug management indicators related to poor control—high SABA use and low preventer use—individuals age 20 and over were at highest risk for suboptimal management.

What do the results mean?

This study identifies several opportunities to improve the quality of asthma care in Saskatchewan:

Improve control of asthma

Nearly one in five people with asthma in our study population were in poor control of their condition. Most of the 4,267 persons in poor asthma control were using high amounts of short-acting beta2-agonists (SABA) for frequent symptom relief. This figure likely underestimates those in poor control, given the limitations of the study noted earlier. Other surveys which measure asthma symptoms directly note higher rates of poor control.⁴ All regional health authorities have room to improve asthma management. Improving asthma control and reducing frequency of symptoms can mean better quality of life.

Reduce asthma hospitalizations

Our study showed wide variation in hospitalization rates in the province. Canadian statistics show that asthma hospitalization rates in Saskatchewan are one third above the national average.⁹ There is good evidence demonstrating that improved medication management and patient education can lead to better asthma control and fewer hospitalizations.^{8,7}

Furthermore, in this study, a number of regions with higher rates of suboptimal drug management also had more hospitalizations.

Reducing the provincial rate for hospitalizations from 11 per 1,000 persons with asthma to eight per 1,000, the lowest rate reported among Saskatchewan RHAs, would bring the provincial rate to a level comparable to the national average. There may be further room for improvement to reach Ontario's hospitalization rate for asthma, which is 45 per cent lower than Saskatchewan's.

Increase preventer medication use

A key step in reducing poor control and hospitalizations is greater use of preventer medications. We found that over one third of patients in poor control were not on any preventer medication, and many of those on the most common preventer, inhaled corticosteroids, were on a potentially inadequate dose. Another sign of underuse of preventer medications is that those in poor control and already taking high doses of inhaled corticosteroids could potentially benefit from an additional preventer medication. However, only 42 per cent of such patients received these drugs.

High SABA use and low use of preventers was most common among adults aged 20 and over. Planners may wish to pay particular attention to this age group when designing quality improvement interventions.

Reduce wet nebulized drug use

The Canadian Asthma Consensus Guidelines^{1,2} discourage the use of wet nebulized drugs because more effective and less expensive dry-powdered forms of the same medications are available. Reducing use of this medication to near zero could potentially save health system costs, without compromising outcomes, and improve patient convenience.

Rates of wet nebulized drug use were markedly lower in Saskatoon and Regina

Qu'Appelle Health Regions. An important first step will be to determine how these regions achieved this. Activities elsewhere may also provide ideas for improvement. In Nova Scotia, a multifaceted quality improvement program successfully reduced wet nebulization respiratory medication use.⁸ Other jurisdictions have limited reimbursement for wet nebulized drugs to those meeting stringent criteria, without increasing physician visits or hospitalizations for respiratory conditions.⁹

Increase spirometry use

The Canadian Asthma Consensus Guidelines recommend regular use of spirometry as an objective measure for assessing asthma control. Only nine per cent of asthma patients had a spirometry test in 2003-04.

Possible explanations for findings

There are many possible reasons why asthma management is less than optimal. Patient knowledge about asthma is a critical component of good control. If a patient is unaware of proper drug management, he may not inform his doctor that he is using a SABA puffer too frequently, or be unaware of the need to adjust the use of preventer medications to avoid symptoms. A patient who is unaware about the importance of avoiding triggers may resort to frequent use of SABA. Lastly, if an individual does not understand the warning signs of a severe exacerbation, he may delay seeking treatment until a hospitalization becomes necessary.

Gaps in knowledge about the latest asthma guidelines may also contribute to poor control. Some physicians may be accustomed to prescribing salbutamol and other SABAs in what used to be the standard dosage: "one to two puffs four times a day."¹⁰

TABLE 2: ASTHMA INDICATORS AT A GLANCE, IN SASKATCHEWAN, FISCAL YEAR 2003-04*

	Asthma prevalence** 2002-03	Hospitalization rate	Spirometry testing	Poor control	High SABA use	Wet nebulized drug use	Poor control and moderate ICS	Poor control and no ICS	Poor control, high ICS and other preventer	High SABA and main preventer	Theophylline and main preventer
	rate (%)	per 1,000 people with asthma	rate (%)	rate (%)	rate (%)	rate (%)	rate (%)	rate (%)	rate (%)	rate (%)	rate (%)
All Saskatchewan	3.8	11	9	18	17	5	22	37	42	63	65
Most Favourable Regional Score in Saskatchewan***	1.4	8	15	15	15	2	—	33	—	67	—
Age (years)**											
6 - 9	6.6	18	13	5	4	10	15	10	NR	93	NR
10 - 14	5.8	9	12	8	7	6	15	24	NR	79	NR
15 - 19	4.0	13	8	15	14	4	14	31	35	71	NR
20 - 29	3.2	11	6	23	22	3	16	45	46	56	75
30 - 44	3.0	10	7	25	25	4	22	42	41	59	67
45 - 55	3.2	8	11	23	23	6	34	35	42	66	66
Sex											
Female	3.8	13	9	15	14	6	22	35	48	66	64
Male	3.8	9	9	21	20	5	22	39	36	61	66
Health Regions (RHA)											
Sun Country	3.7	19	5	19	18	11	13	45	51	56	NR
Five Hills	4.6	18	4	20	19	9	21	40	42	60	68
Cypress	3.2	7	6	19	19	9	21	47	NR	53	65
Regina Qu'Appelle	4.7	13	7	19	18	3	23	33	47	67	66
Sunrise	3.7	9	5	18	17	10	21	40	49	64	78
Saskatoon	3.7	8	15	15	15	2	23	37	38	63	71
Heartland	3.5	15	9	17	16	8	23	38	50	62	NR
Kelsey Trail	2.9	12	8	18	17	6	25	32	39	67	NR
Prince Albert Parkland	3.4	NR	9	18	18	6	22	43	48	58	53
Prairie North	2.6	10	7	18	18	11	22	39	NR	64	54
Northern Sask****	1.4	NR	4	23	23	4	26	32	0	70	—

* Excludes Saskatchewan residents with Registered Indian status.

** Prevalence was determined in fiscal year 2002-03, using 5-9 years as the youngest and 45-54 years as the oldest age groups, respectively. All other age groups are as indicated.

*** To be identified as the most favourable score, the RHA adjusted rate needed to be statistically significantly better when compared to all other regions combined.

**** Includes Keewatin Yatthe, Mamawetan Churchill River and Athabasca Health Authorities.

BOLD indicates rates that are statistically significantly better than the rate across all other categories within the classification variable (age, sex or region) combined.

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NR indicates analysis not reported due to small numbers.

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"My child has grown significantly in the past year now that her asthma is under control"

"For the first time in my life, I feel free!"

TABLE 1: QUALITY OF CARE INDICATORS

Indicator	Why is it important?	Provincial Average (crude rate)	Range in Saskatchewan (adjusted rates)	Most Favourable Regional Score*
Rate of hospitalizations among persons with asthma.	Hospitalizations can be avoided by optimal drug management, avoidance of triggers, and knowing what to do when symptoms worsen.	11 / 1,000 people with asthma	7 / 1,000 - 19 / 1,000	Saskatoon (8 / 1,000)**
Percentage of persons with asthma who had at least one spirometry test in 2003-04.	Spirometry is recommended as the preferred objective measure for diagnosing asthma and assessing asthma control.	9%	4% - 15%	Saskatoon (15%)
Percentage of persons with asthma who have poor asthma control.	Persons who are either using high doses of short-acting beta2-agonists (SABA), have been hospitalized, or died from asthma may be considered to be in poor control.	18%	15% - 23%	Saskatoon (15%)
Percentage of persons with asthma dispensed high amounts of inhaled SABA.	A person with asthma using more than four SABA puffers per year is likely using SABA more than the recommended guideline of no more than three times per week, plus once daily for exercise-induced symptoms if needed. Excessive use suggests poor control of symptoms.	17%	15% - 23%	Saskatoon (15%)
Percentage of persons with asthma dispensed wet nebulized asthma drugs.	Wet nebulized asthma medications are rarely indicated in people at any age. They are generally less effective, less convenient, and more expensive.	5%	2% - 11%	Saskatoon (2%)
Percentage of persons with poorly controlled asthma who were also dispensed at least moderate doses of inhaled corticosteroids (ICS).	Those in poor control should be receiving at least moderate doses of inhaled corticosteroids in addition to SABA use.	22%	13% - 26%	No regional health authority (RHA) had a significantly better rate compared to all other regions combined.
Percentage of persons with poorly controlled asthma who were not dispensed an ICS.	Those in poor control should be receiving at least moderate doses of inhaled corticosteroids in addition to SABA use.	37%	32% - 47%	Regina Qu'Appelle (33%)*
Percentage of persons with poorly controlled asthma who were dispensed high doses of other preventer medication.	Those in poor control who are using high doses of ICS should also be on another preventer.	42%	38% - 51%	No RHA had a significantly better rate compared to all other regions combined.
Percentage of persons with asthma dispensed high amounts of SABA who were also dispensed main preventer medication.	Persons with asthma receiving high amounts of SABA should also be taking a preventer medication.	63%	53% - 70%	Regina-Qu'Appelle (67%)*
Percentage of persons with asthma dispensed theophylline-like drugs who were also dispensed main preventer medication.	If an asthma patient is on a theophylline like drug, he or she should be taking another preventer medication at the same time.	65%	53% - 78%	No RHA had a significantly better rate compared to all other regions combined.

* To be identified as the most favourable score, the RHA adjusted rate needed to be statistically significantly better when compared to the average of all other regions combined.
 ** Although there are one or two regions with lower adjusted rates, small sample sizes did not allow us to determine if these were significantly different than the indicator compared to all other regions combined.

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ISBN 1-897155-20-4

Recommended citation format:

H Klomp, BTB Chan, D Jorgenson,
P Cascagnette, L Gander.
Breathing Easier - Opportunities to improve
the quality of asthma care in Saskatchewan.
Saskatoon: Health Quality Council.
September 2005.

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Adding to the confusion is that drug company monographs¹¹ still recommend this dosage level, despite the fact that it is inconsistent with the Canadian guidelines. The persistent use of wet nebulized drugs could also be due to lack of awareness of guidelines. Or, in the case of older patients on wet nebulized drugs, there may be a reluctance to switch patients who are already accustomed to using a particular form of medication.

Poor coordination of care may also contribute to some of these findings. Many primary care providers work in isolation of each other, when the literature consistently reports improved health outcomes when care is delivered in an interdisciplinary or team environment. It would be much easier to ensure optimal medication management and target educational programs if pharmacists, physicians, and asthma educators had a more formal process for sharing information about their patients.

Lack of knowledge about the guidelines may also be behind the low use of spirometry. Application in the family practice setting requires both an initial purchase of equipment, appropriate training of staff, and maintenance of equipment. This may be difficult to achieve in a busy clinic. Although spirometry can also be performed in a pulmonary function lab, access to such facilities may be more difficult for rural patients. An alternative may be to develop a program to train and certify individuals (such as nurses or pharmacists) who could perform spirometry in accessible locations (such as walk-in clinics or community pharmacies).

Next steps

Our Asthma Care Quality Improvement Guide describes five evidence-based approaches for improving asthma care:

- Patient education, particularly intensive programs that include individualized self-management action plans;
- Providing clinicians with decision support tools such as asthma care flow sheets that are placed in medical charts to serve as a reminder to follow clinical practice guidelines;
- Interdisciplinary management, where physicians, nurses, pharmacists, certified asthma educators or other health professionals work as a team to coordinate asthma care;
- Health professional education delivered in an interactive setting and complemented by decision-support tools, and,
- Regulatory approaches, such as changing drug formulary status, in order to influence prescribing practices.

Health professionals and planners can apply one or more of these approaches in order to improve quality. The strategies address, in different ways, the issues related to patient knowledge of asthma and use of best practices described in this report. For detailed information about these five approaches, please refer to the Health Quality Council Asthma Care Quality Improvement Guide.

Application of best practices requires more than just passive dissemination of guidelines and information. A concerted effort involving a variety of quality improvement approaches is required to increase the likelihood of achieving measurable improvements in the quality of asthma care. The Health Quality Council is currently working with other provincial organizations to identify teams of community groups and health care professionals who are interested in trying some of these approaches to improve the quality of care for Saskatchewan people living with asthma.



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